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TERRELL'S CHEMICAL WATER TEST

To Help Determine What Plants Will Thrive
In Your Lake, Pond, Marsh or Stream.

Chemical condition of water is one of the most important factors that determines what plants will grow in it. Some important water plants require hard (Alkaline) water which contains lime just as alfalfa and certain farm crops need lime in the soil. For example Wild Rice prefers hard water and Muskgrass (*Chara*), Sago Pond Plant (*Potamogeton pectinatus*) and Wild Celery require hard water in order to thrive. Some water plants such as Water Shield (*Brazenia*) and Bladderwort (*Utricularia*) prefer soft (acid) water which does not contain much lime. A few plants like Water Lilies, Wapato (*Sagittaria latifolia*) grow well in either soft (acid) or hard (alkaline) water.

It is certainly important to know what kind of water you have in order to select the proper water plants for your conditions. Hard water is most productive of fish food and fish as well as of waterfowl foods.

A simple chemical kit has been worked out to aid you in quickly determining what plants are best adapted to your waters. It will also guide you in determining what kind of fish will do best in your waters. As you will naturally plant the most suitable kinds of plants, or stock with the best kinds of fish, this kit should save you money by preventing purchases of unsuitable materials and will increase your measure of success with your plants, if you make use of it.

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WHAT TO PLANT

FOLLOW DIRECTIONS FOR WATER TESTS ON PAGE 3.

(The most suitable plants for each condition are written in capitals.)

III - Best Type of Water for Planting; II - Next Best Type; I - Poorest Type.

I - IF WATER TESTED TURNS YELLOW OR STAYS COLORLESS, it is acid or Soft Water. Plant:Submerged Water PlantsBLADDERWORT
(Utricularia)

-S- Grows chiefly in south.

Not well suited to fish production.

Water Plant With Leaves
Above SurfaceCat-tails (Typha)
Frogbit (Limnobium) -S-
NUTTALL'S PONDWEED
(Potamogeton epihydrus)
Pheasant Berry
WATER LILIES (Castalia)
WATER SHIELD (Brazenia)
YELLOW WATER LILY
(Nuphar)Marsh and Shore Plants

(Plant those marked * on land)

* BLUE WATER IRIS
(Iris versicolor)
* DUCK WHEAT
(Fagopyrum tataricum)
Pheasant Berry
* Smartweeds (Polygonum)
WAMPEE (Peltandra)
Wapato Duck Potato
(Sagittaria latifolia)
* WILD DUCK MILLET
(Echinocloa)II - IF WATER TESTED TURNS GREEN, it is slightly acid or Neutral (Medium) water. Plant:BLADDERWORT
(Utricularia)COONTAIL
(Ceratophyllum)Dwarf Bushy Pond Plant
(Naias flexilis)

-S- Grows chiefly in South.

Bulrushes (Scirpus)
DUCK'S MEATS (Lemma,
Wolffia & Spirodela)
Frogbit (Limnobium) -S-
NUTTALL'S PONDWEED
PICKEREL PLANT
(Pontederia)
SMARTWEEDS (Polygonum)
(Most all varieties)
SPATTERDOCK (Nuphar)
WATER LILIES (Castalia)
WATER SHIELD* BLUE WATER IRIS
Bur Reed (Sparganium)
BUTTON BUSH (Cephalanthus)
CAT-TAILS (Typha)
* CORD GRASS (Spartina)
* DUCK WHEAT (Dry land)
Frogbit (Limnobium) -S-
* MARSH MALLOW (Hibiscus)
* PHALARIS GRASS
PHEASANT BERRY
* SMARTWEEDS
* SWAMP LOOSESTRIFE (Lythrum)
SWEET FLAG (Acorus)
WAMPEE (Peltandra)
WAPATO DUCK POTATO
(S. latifolia)
* WILD DUCK MILLET

Other conditions being satisfactory we plant Black Bass, Trout and most pan fish in such water but avoid planting Wall-eyed Pike (Pike-Perch), Muskalonge and Pickerel which are very cannibalistic and require large amounts of food. It has been estimated that it takes at least 10 pounds of other fish to make 1 pound of Wall-eyed Pike. Brook or Speckled Trout prefer water not over 68° F.; Brown and Rainbow Trout not over 74° F.

III - IF WATER TESTED TURNS BLUE, it is Hard (alkaline). Water contains lime. Plant:BUSHY POND PLANT
(Naias) both types

COONTAIL (Ceratophyllum)

ELODEA (Philotria)

HORNED POND PLANT
(Zannichellia)

MUSKGRASS (Chara) *

REDHEAD GRASS (Bass weed)
(Potamogeton richardsonii)

SAGO POND PLANT (Potamogeton pectinatus) *

WATER MILFOIL
(Myriophyllum)WIDGEON GRASS (Ruppia)
(Brackish water only)WILD CELERY
(Vallisneria)* - Use special chemical test;
needs very hard water.AM. LOTUS (Nelumbo)
BULRUSHES (Scirpus)
DEEP WATER DUCK POTATO
(Sagittaria rigida)
DUCKS MEATS (Lemma,
Spirodela & Wolffia)
LONG-LEAF POND PLANT
(Potamogeton americanus)
PICKEREL PLANT
(Pontederia)
WATER LILIES
WATER SMARTWEED
WILD RICE
(Zizania aquatica)* BLUE WATER IRIS
BUR REEDS (Sparganium)
Button Bush
CAT-TAILS (Typha)
* CORD GRASS (Spartina)
* DUCK WHEAT (Dry land)
* MARSH MALLOW (Hibiscus)
* PHALARIS GRASS
PHEASANT BERRY
PICKEREL PLANT (Pontederia)
REED GRASS (Phragmites)
RICE CUTGRASS (Leersia)
* SWAMP LOOSESTRIFE (Lythrum)
* SMARTWEEDS
SWEET FLAG (Acorus)
WAPATO DUCK POTATO
WATER CRESS (Shallow spring
water not freezing)
* WILD DUCK MILLET
WILD RICE

Highly productive of fish food. Most aquatic plants do well in this type of water. We plant most all fishes in such water, including Wall-eyed Pike and Muskalonge.

Note special conditions on attached sheet for various plants.

TERRELL'S WILDLIFE CONSULTANTS,
Over 50 Years Practical Experience Growing Water Plants
Oshkosh, Wisconsin, U.S.A.

DIRECTIONS

CAUTION: Do not let hands, metal or other matter touch water which is being tested, or inside of cup used. It may affect the test.

1. Wash, rinse and empty a clean, white tea cup three times with the same water as is to be tested.
2. Drop into the empty, washed tea cup 1 of the small pieces of paper from the attached envelope. Pour or drop 10 to 20 drops or about $\frac{1}{2}$ teaspoonful of water to be tested on the paper in the cup. Let stand 10 minutes, then note color of the water, not the paper, and see list, on page 2, of the plants suitable for growing in it.
3. Observe other special conditions required for the various plants.

Other Tips on Planting Water, Land and Shore Plants

1. If possible start plantings in bays and other places protected from strong waves and currents and let them spread to more exposed situations.
2. Select fertile bottom not densely grown up to other plants if possible.
3. Plant up stream — the current will spread planting down stream.
4. Submerged water plants such as Wild Celery, Elodea, and Muskgrass should not be planted in very muddy but in fairly clear water. In muddy water use plants which have leaves growing above the surface.
5. IN SALTY OR "ALKALI" * WATERS.— Do not plant Wild Rice in water salty or "alkali" to taste. Muskgrass, Sago Pond Plant, Redhead Grass and Wild Celery grow in waters slightly salty to taste, as well as in hard fresh waters. Widgeon Grass (*Ruppia*) grows only where salt is present in either slight or great amounts, or in "alkali" waters inland. Cat-tail will grow both in fresh and rather salt water. Giant Burreed grows in fresh and also slightly salty or slightly "alkali" water. Salicornia and Salt Marsh Bulrush grow on salt marsh. All of the above mentioned plants grow under water except Wild Rice, Cat-tail, Burreed, Salicornia and Salt Marsh Bulrush, which grow on wet shores and in shallow water, with leaves above surface.

* - NOTE: "Alkali" waters are those found chiefly in western states and provinces that contain considerable amounts of various chemical salts in solution, which leave a white deposit when water evaporates.

